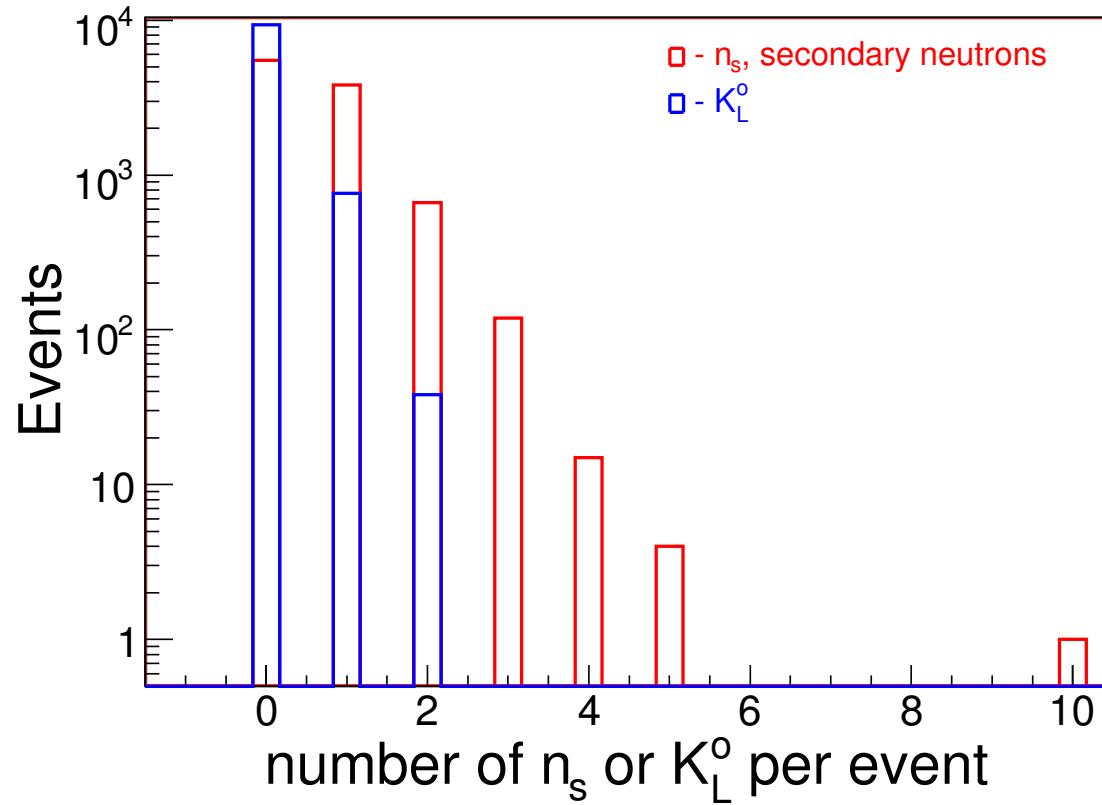


Monte Carlo Neutron Update

MC sample: Andre's pC interactions at 120 GeV

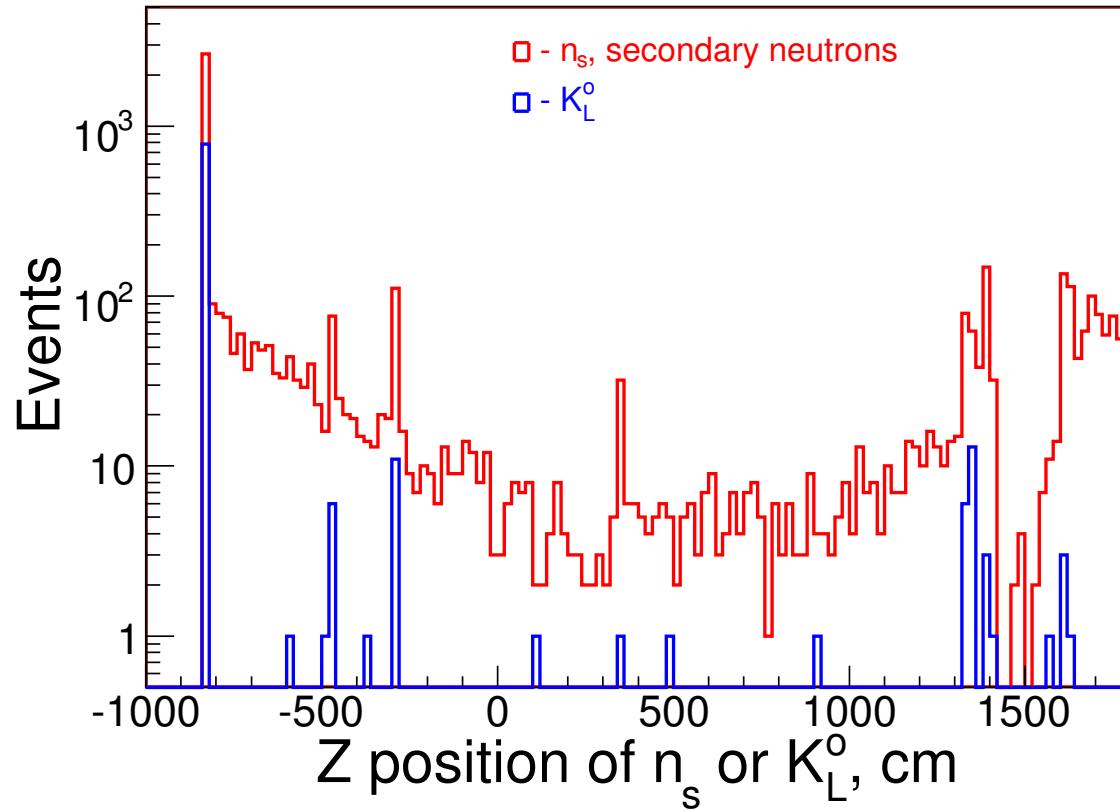
- K_L^0 and secondary neutron, n_s , contributions studies
- update HCAL acceptance
- update proton efficiency
- $K_L^0 + n_s$ contribution to N_n / N_p ratio

number of n_s and K_L^0 in event



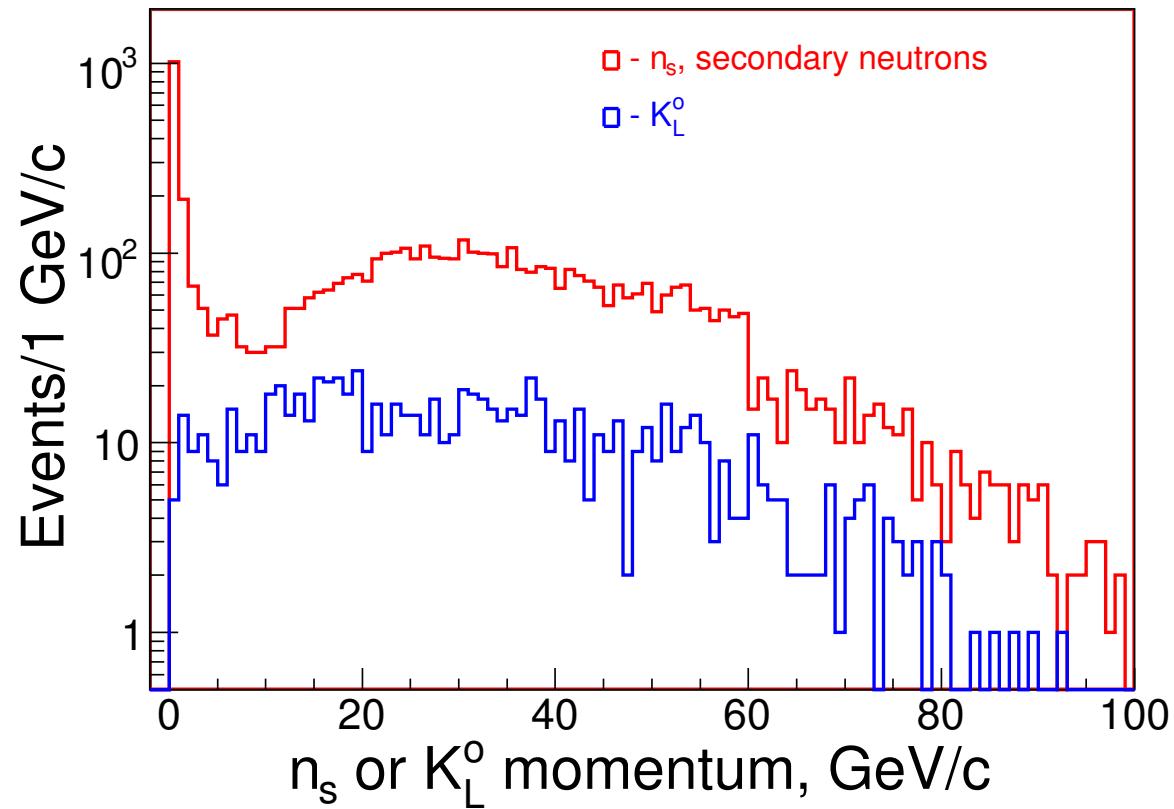
The number of the secondary neutrons, n_s , and K_L^0 in Monte Carlo event. They all pointing into the HCAL fiducial and due to of that they might generate a fake neutron signal. Requirement: n_s and K_L^0 should not be in event where the leading neutron or proton were found.

Z position of n_s and K_L^0



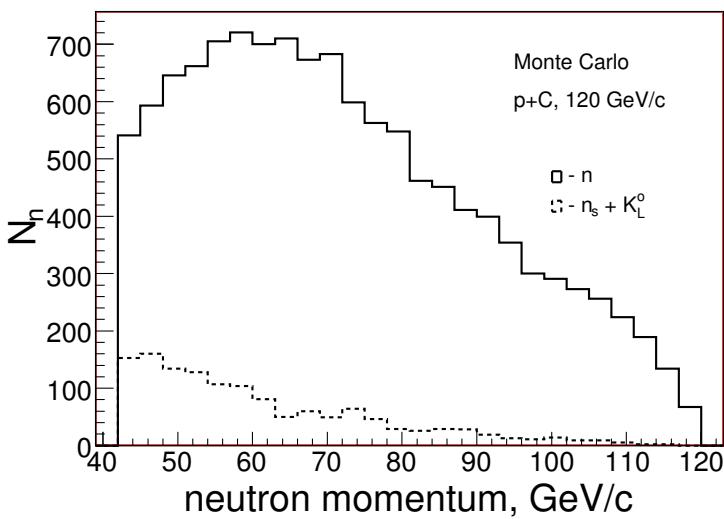
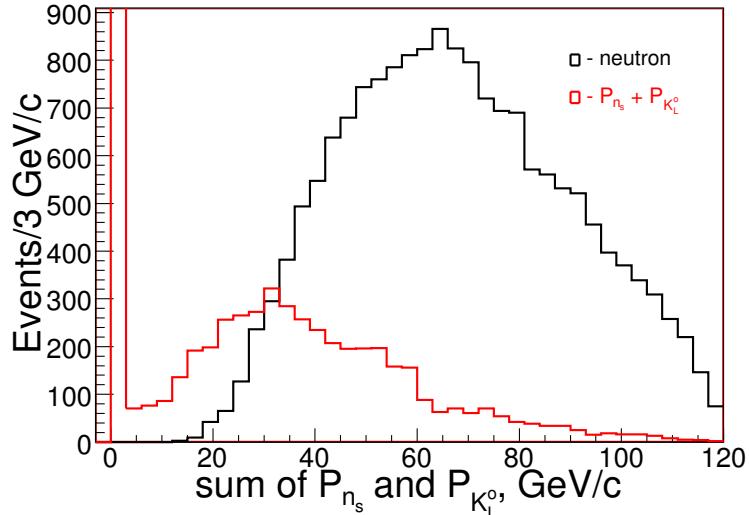
The Z position of n_s and K_L^0 in Monte Carlo event. First left spike - target position, second - Ckov, third - ToF wall, at 350 cm - front of RICH, next - RICH downstream wall, EMCAL - at 1612.

momentum of n_s and K_L^0

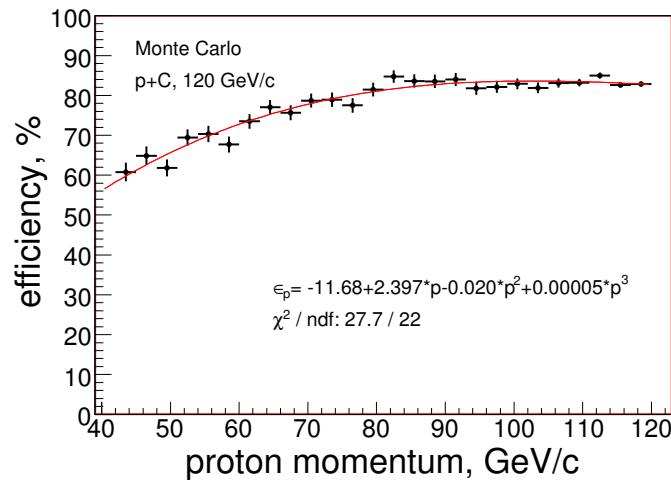
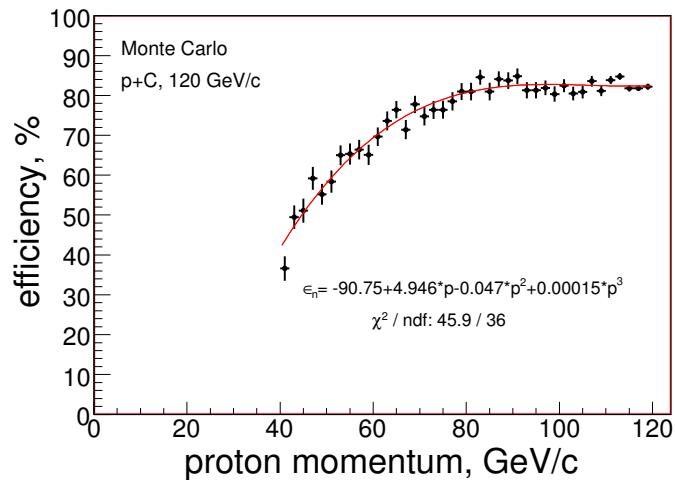
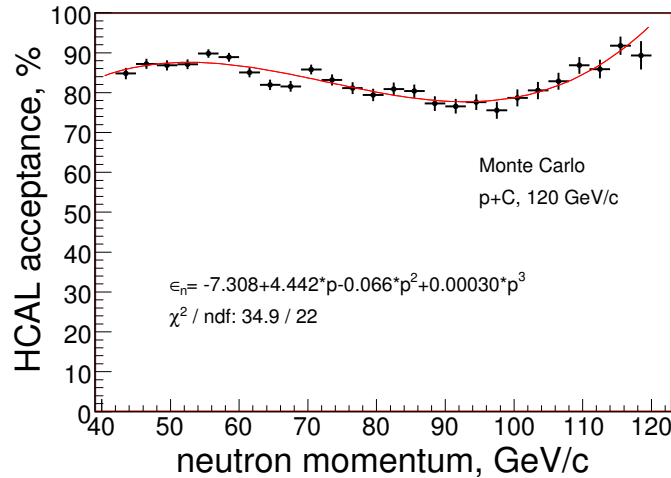
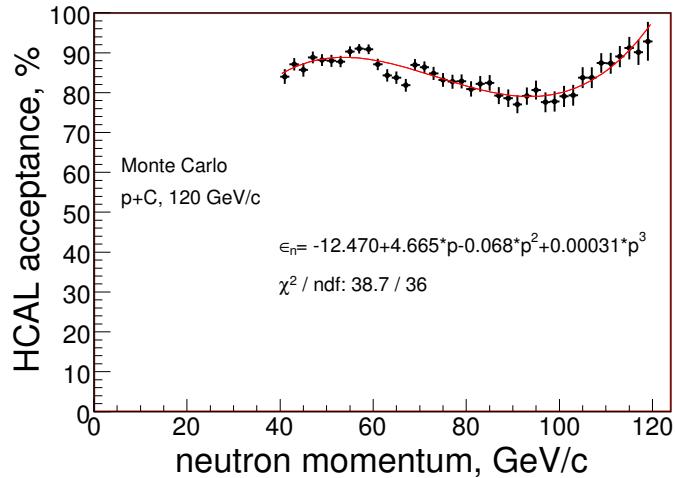


The momentum of the n_s , and K_L^0 in Monte Carlo event.

sum of n_s and K_L^0 momentums

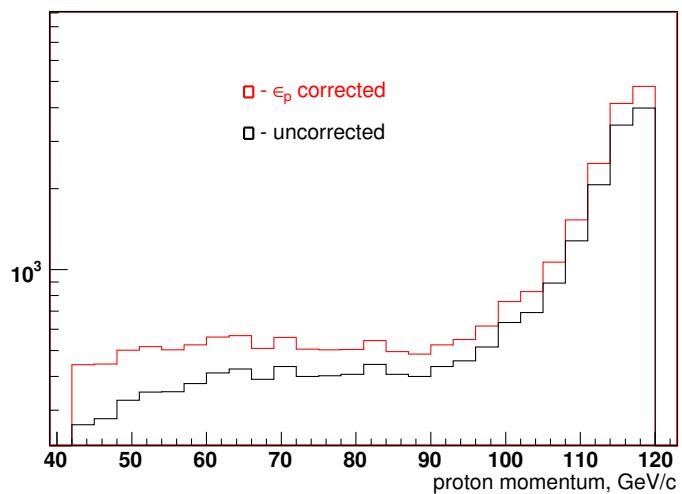
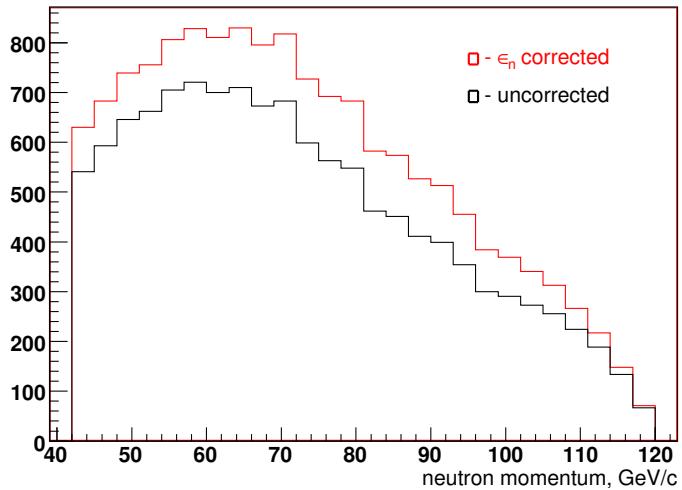


recalculate ϵ_n and ϵ_p

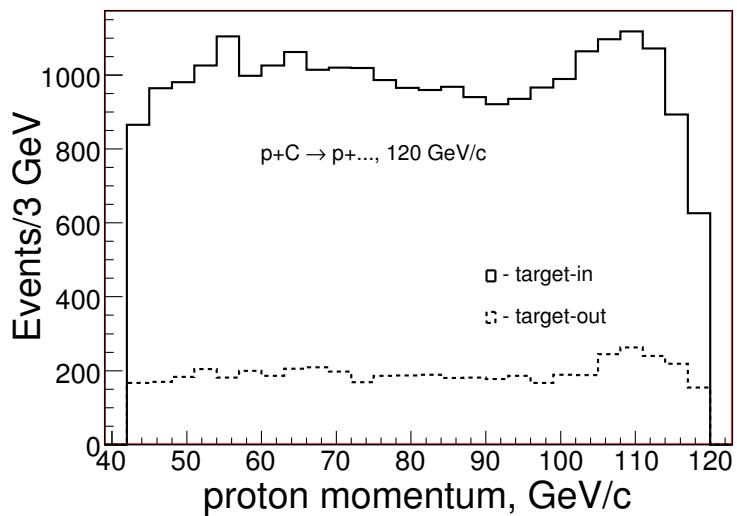
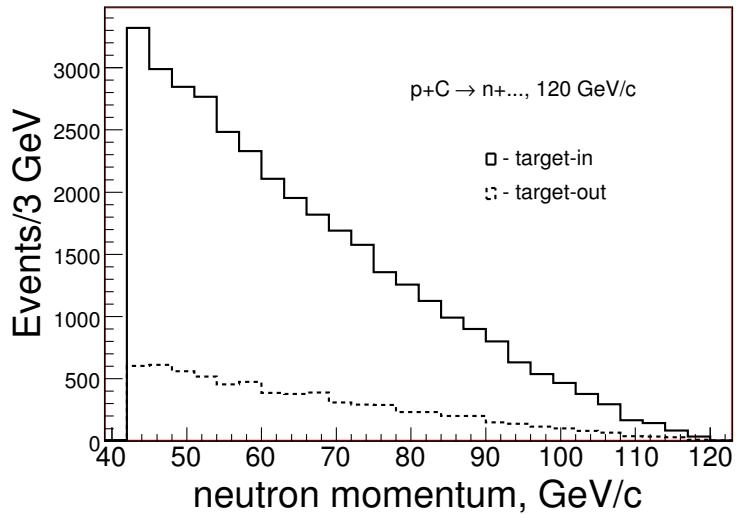


Left plots - what was before, right - updated version: rebinning and proton selection

Monte Carlo: correcting for efficiencies



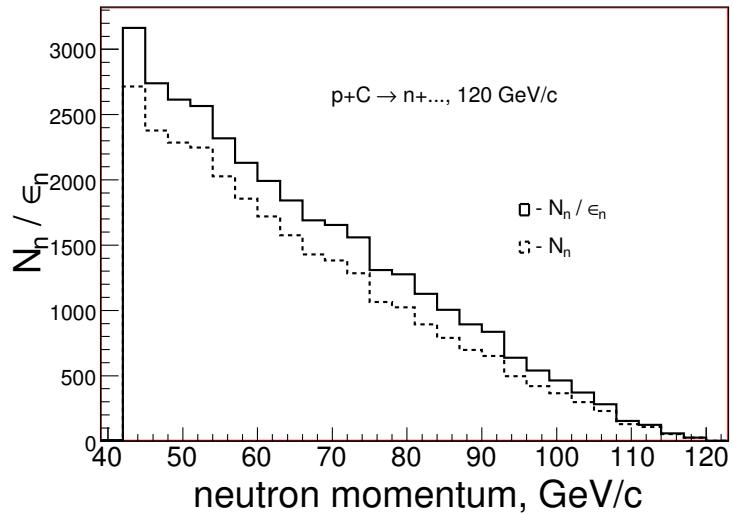
real data: target-in vs target-out



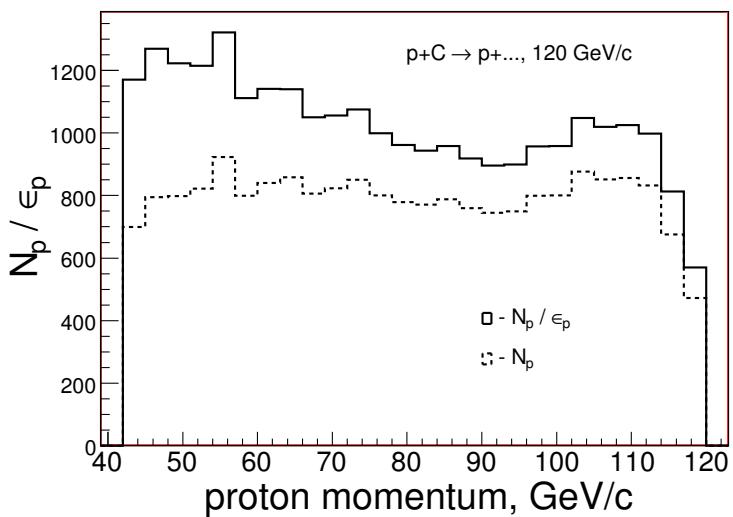
Top plot - the inclusive neutron spectrum, updated binning.

Bottom plot - the inclusive proton spectrum. Particle selection in RICH: the window to grab the data point was ± 1.2 cm along the radius axis, now in orthogonal direction to slope.

real data: correcting for efficiencies

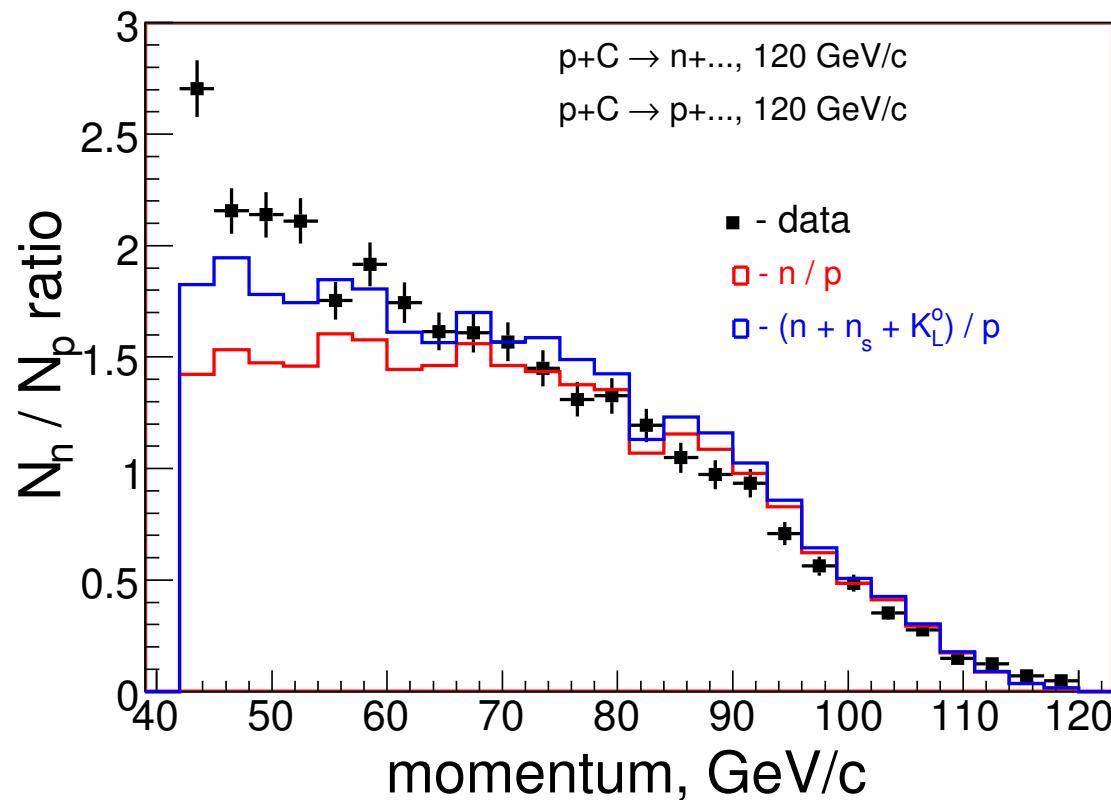


Top plot - the inclusive neutron spectrum.
 The target-out data was subtracted, then it corrected for the HCAL acceptance.



Bottom plot - the inclusive proton spectrum.
 The target-out data was subtracted, then it corrected for the proton reconstruction efficiency.

N_n / N_p ratio



The N_n / N_p ratio for the inclusive neutrons and protons. Red plot - Fluka n/p ratio prediction.
 Blue plot - Monte Carlo (Fluka + Geant) $(n + n_s + K_L^0) / p$ ratio prediction.